



Woodsmith[®] PLANS

TRADITIONAL SWING-LEG TABLE



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Attractive, practical, and best of all, fun to build — this table has all the ingredients for a great project.



The elegant look of this drop-leaf table is undeniably eye-catching, but it's also a bit deceiving. This is no ordinary drop-leaf table — it's a classic swing-leg table.

Tables of this practical design have been built for well over 200 years. The trick is that two legs at opposite corners of the frame swing out to support the raised leaves (inset photo). With the leaves folded, the table tucks neatly against a wall. When a larger table is needed, lift a leaf, swing a leg, and you have a small dining or game table.

But the versatile function of this project is only half the story. As you might imagine, building it involves some timeless woodworking. The unique frame accommodates the two pivoting legs by means of wood hinges or “knuckle joints” — certainly not an everyday shop task. And making the round top with its two drop leaves adds another opportunity to expand your skills.

If this isn't enough to pique your interest, I've thrown in a couple of design options (page 10). It all adds up to a combination that's hard to beat.



▲ Need a larger table? Lift a leaf and swing out the leg to support it.

Construction Details

Overall Dimensions: 36" x 36" x 29³/₄" (Leaves Extended); 36" x 12³/₈" x 29³/₄" (Leaves Folded)

NOTE: Router trammel used to shape round top

Round top complements light, graceful frame

Support block connects inner and outer side rails

Roundover profile on edge

Hinged outer side rail holds swinging leg

Table frame is built using double set of apron rails

Knuckle joint in outer side rail allows leg to swing

Hinge pin made from 1/4"-dia. brass rod

Inner side rails form the backbone of the frame

End rails and inner side rails joined to form sturdy core for frame

Applied bead molding softens lower edge of apron rails

NOTE: Turned, Sheraton-style legs are purchased, see page 3

NOTE: See page 7 for source information for hinges

Fixed leg joined to end rails

NOTE: Table can be built in several styles. For options, see page 10

Leg and rail section swing away from frame to support leaf

Knuckle joint pivots on brass hinge pin inserted through joint

Bevels on back side of slots allow joint to pivot freely

Fingers and slots mesh to create smoothly pivoting joint

Leaves and top mate with traditional rule joint

Table leaf hinges mortised into underside of top

round top. But as I mentioned, you have several styles from which to choose. Before you start on the frame, make this decision and either order or make the legs. If you decide to build a simple, country-style table, the box at right will show you how to make a set of tapered legs.

MORTISES. With the four legs in hand, I picked out two to be the fixed legs and two for the swinging legs and marked them clearly. The swinging legs can be set aside while the fixed legs go to the bench to have the mortises laid out.

Each fixed leg has an identical pair of mortises — one for the end rail and one for the outer side rail you'll add later. The dimensions are shown in details 'a' and 'b' on page 3.

Once the layout is complete, you can get down to business. I started at the drill press — drilling out the bulk of the waste from each mortise. Next, I took the legs back to the bench to square up the mortises with chisels.

"FIXED" FRAME. With work on the mortises done, you can start building the fixed frame that connects the two legs. First, you'll need to cut the two end rails and the two inner side rails to final width and length. Next, some basic joinery is in store.

TENONS. I started with the end rails. Note that even though the two rails are on opposite ends of the frame, they are made identically.

On one end, you'll need to cut a $\frac{1}{4}$ "-thick tenon to fit the mortise in the fixed leg (detail 'a'). This task can be accomplished with a wide dado blade installed in the table saw. The opposite end of the short rail is left square — the swinging leg butts against it when the table is "closed."

TONGUE & DADO. The tenons take care of the end rail to leg joinery. The frame joinery is completed by connecting the side rails to the end rails with tongue and dado joints.

Your goal is to make certain that the outside face of the side rail is flush with the tenon shoulder and the square end of the end rail. A look at detail 'c' and the box on page 3 will fill you in on the technique.

ASSEMBLY. Once the work on the rail-to-rail joinery is complete, you can

Swing-leg tables were often built in a simple "country" style using tapered legs and a square top, as shown on page 10. One advantage to this design is that it allows you to make your own tapered legs.

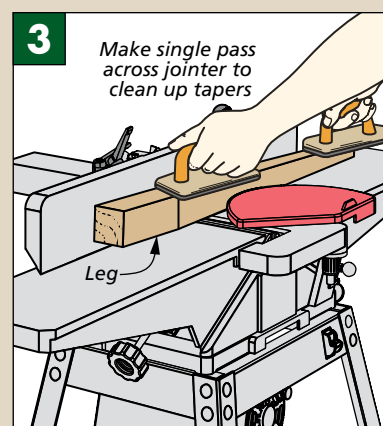
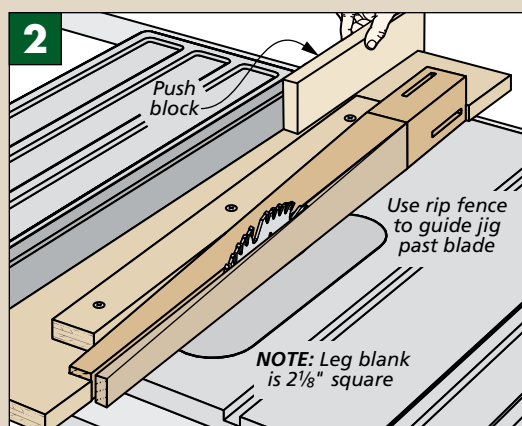
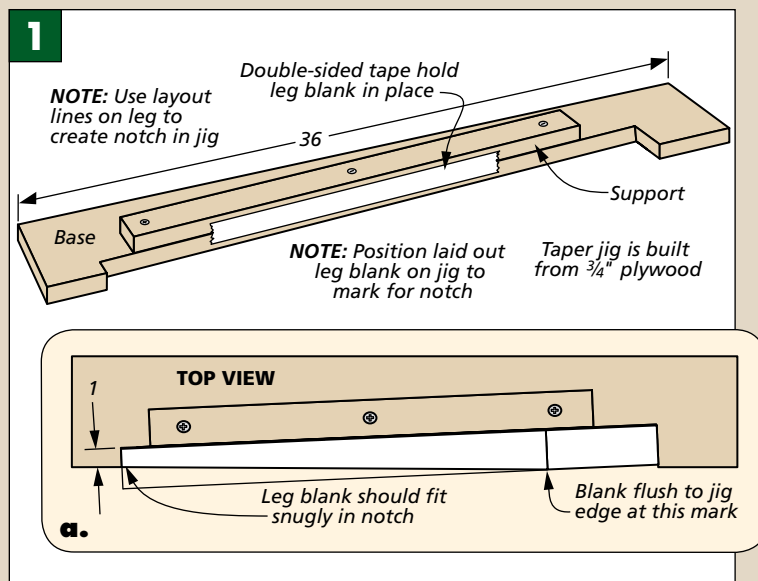
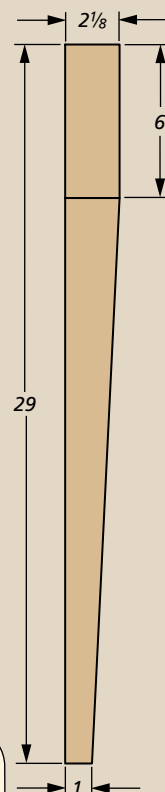
To get started, you'll need four $2\frac{1}{8}$ "-square blanks cut to length. The blanks can be glued up, but blanks cut from solid stock will give you a nicer-looking leg.

The leg is tapered only on the two inside faces, starting 6" from

the top. To make the taper cuts on the table saw, I built the plywood jig, shown in Figure 1. The blank rests in the tapered notch and is held in place with double-sided tape. Then the blank and jig are pushed through the blade using the rip fence as a guide.

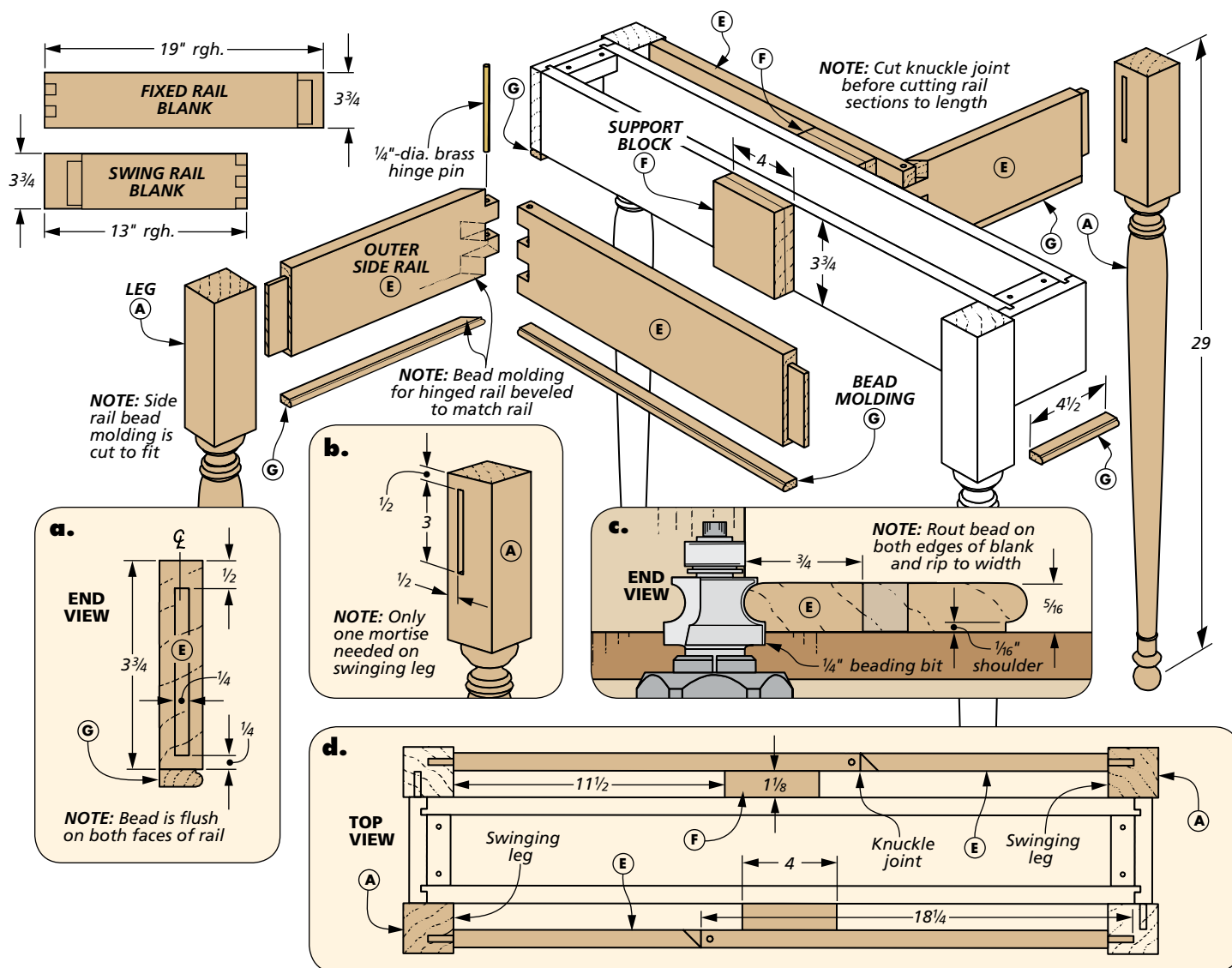
When I made the cuts at the saw, I left a little bit of waste to be cleaned up with a pass across the jointer. Sanding the cut faces is another cleanup option.

LEG PROFILE



start assembling the frame. First, I glued the short rails and the inner rails together, making certain the assembly was perfectly square and not twisted. Finally, I glued the two legs onto the end rail tenons at the opposite corners.

CLEATS. There's one final task to complete. You'll need a way to fasten the tabletop to the frame later. I planned for this by adding a pair of cleats, pre-drilled for screws, to the end rails, as shown in detail 'c.' They're simply glued in place.



Adding the Swing Legs

Things really get interesting now as you install the outer side rails and the swinging legs. The challenge here is creating the knuckle joints that allow the legs to pivot.

KNUCKLE JOINTS. The drawing above shows what's ahead. It may seem backward, but I started with the knuckle joints in the two rails. The reason is that you need to take the completed joint into account when cutting the rails to their final length.

Page 6 shows how I made the knuckle joints. It starts out similar to a box joint. But instead of gluing the joint, you install a hinge pin that allows it to pivot.

The best approach is to take it slow. I went as far as making a complete trial joint. This is a pretty important part of the project, and you want to get it right.

I'll offer one more piece of advice. When cutting the knuckles, shoot for a snug fit. If necessary, it's easy to loosen up the fit with sandpaper. And the joint will likely wear over time.

SIZE THE RAILS. When you're satisfied with the knuckle joints, completing the frame is a breeze. Lay out and cut the single mortise in each swinging leg. Then clamp each leg in place on the frame to take a measurement of the overall leg-to-leg rail length.

Cut the fixed section of the rail to a "hard" dimension of 18 1/4" (detail 'd'). Then I assembled the knuckle joints and used my leg-to-leg measurement to mark a cut line on the swinging section of the rail. Make sure you include the length of the tenons.

FINISH UP. With the rail sections cut to length, they get tenons on the ends. And after making a pair of

support blocks (main drawing and detail 'd'), I started the assembly.

First, I glued the support block to the inner rail. Then, the fixed rail section is glued to the leg and block. Finally, the swinging legs are glued to the swinging rail sections.

BEAD MOLDING. Before assembling the knuckle joints for a test, there's one more thing you need to do. To soften the lower edges of the rails, I added an applied bead molding. It's made on the router table and glued in place with the round of the bead flush with the face of the rails (main drawing and detail 'a'). The side pieces are cut to conform to the two sections of the rail.

A FINAL NOTE. When you install the swing legs, don't seat the pin fully. You won't be able to remove the legs later for finishing.

HOW-TO: MAKE A KNUCKLE JOINT

Making a knuckle joint can be broken down into three basic operations. First, you cut the knuckles. These fit together like the fingers of a box joint. Next, you create relief on the back side of the joint that allows it to pivot without binding. Finally, you drill a hole through the knuckles and install the hinge pin.

TWO BLANKS. To get started, you'll need to cut two, extra-long (about 32") rail blanks to width. Next, I cut each blank into a 19"-long fixed section and a 13"-long swinging section. You should have two clearly marked matched sets.

CUTTING THE KNUCKLES. The $3\frac{3}{4}$ "-wide rails can be divided into five $\frac{3}{4}$ "-wide sections. The fixed section of the rail has three pins and two slots, while the swinging section has two pins and three slots (Figure 1a).

To cut the slots, I put together what is essentially a simple box joint jig for the table saw (Figure 1). With a dado blade sized to exactly $\frac{3}{4}$ " wide, you can cut the slots in a single pass. You'll find the details on the jig and how to use it on page 12.

RELIEF BEVELS. At this point, you have snug-fitting knuckles on the ends of

the blanks. But to make them into a free-swinging hinge, you need to create relief space. This is simply a $\frac{3}{4}$ "-long bevel cut into the back side of each slot, ending sharply at the front face.

The easiest way to create these bevels is with a back saw and a sharp chisel. Define the shoulder lines with a hand saw, and then chisel out the waste (Figure 2). The bevel cuts won't show, so perfection isn't the goal. They just need to do the job.

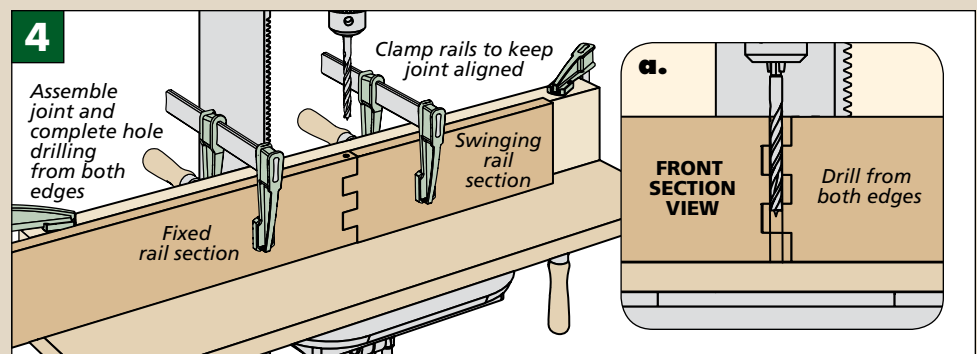
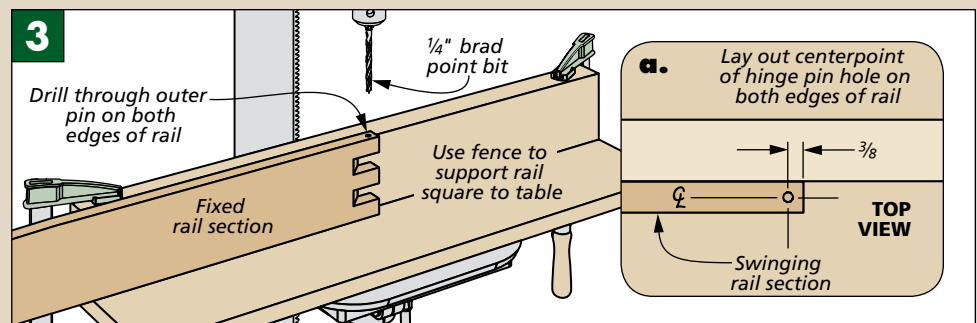
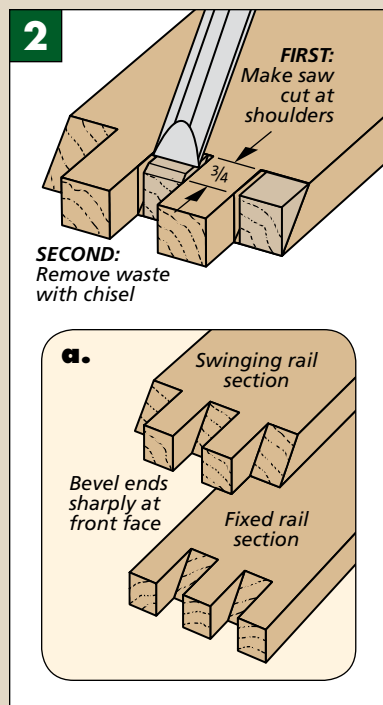
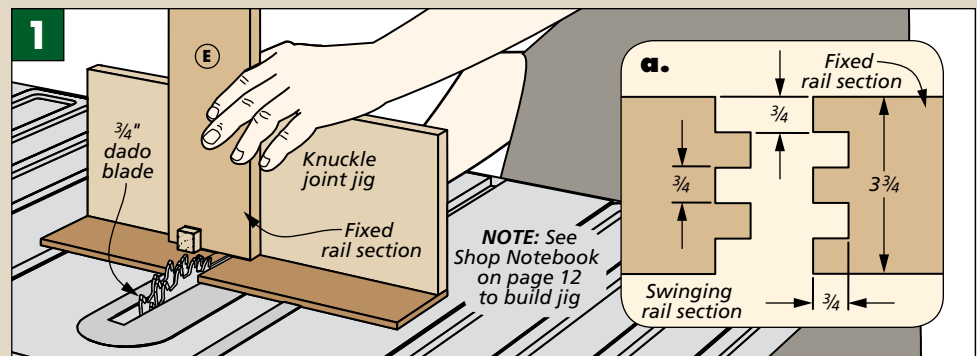
HINGE PIN HOLE. When you've finished the bevels, the last step is to drill a vertical, $\frac{1}{4}$ "-dia. hole through the knuckles for the brass hinge pin. Make sure the hole is centered on the joint and isn't skewed.

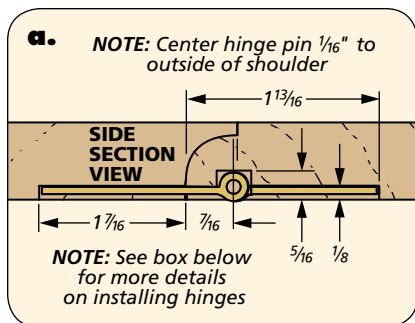
The rail is too wide to drill clear through from one side. You'll need to drill the pin hole from both sides using a drill press or a doweling jig.

I carefully laid out the holes on both edges of the fixed section, marking the centerpoint with an awl. Now, with the joint apart, I drilled through just the outer pin on both edges, as shown in Figure 3. Then I assembled the joint to complete the hole, drilling from both edges (Figure 4).

PIN. Finally, I cut a brass hinge pin to length for each joint. After inserting the pin, test the joint to make sure it swings freely. Don't be surprised if a little fine-tuning is necessary.

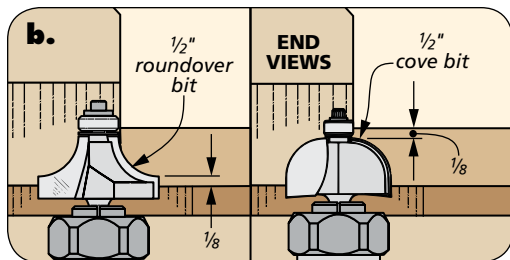
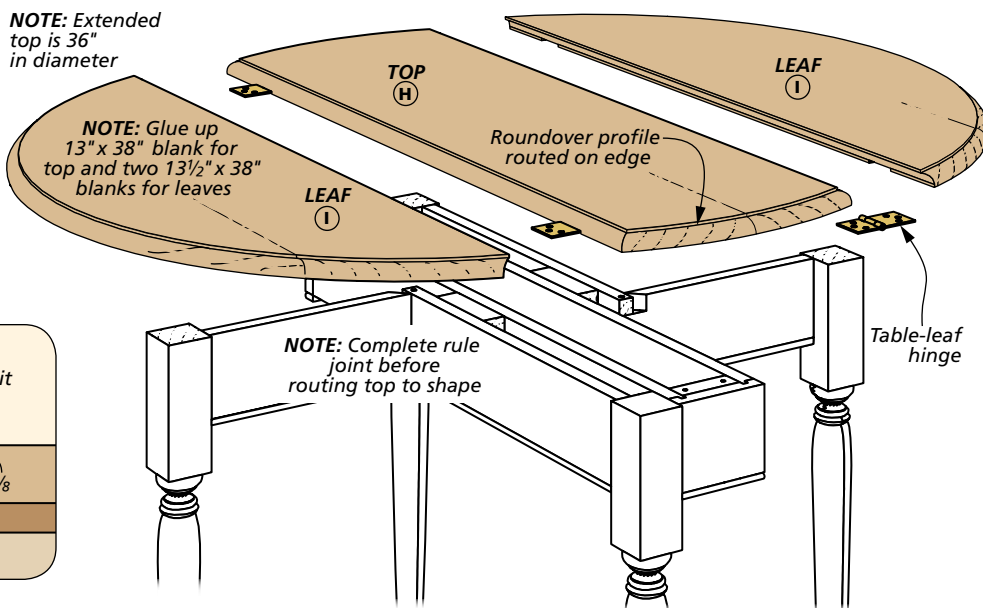
▲ A knuckle joint is basically just a hinge made from wood.





NOTE: Extended top is 36" in diameter

NOTE: Glue up 13" x 38" blank for top and two 13 1/2" x 38" blanks for leaves



Drop-Leaf Top

All you have left to do is make the round, drop-leaf top. This is certainly a bit more involved than a simple slab tabletop, but it isn't difficult. The trick is to take on each distinct task in the right order.

GLUEUP. To get started, I glued up and surfaced three, oversized panels — one for the center section and one for each leaf. You'll need enough material to form the rule joint and then rout the top to its circular shape. So give yourself two extra inches in length and an inch or more in width on each panel.

When choosing and laying out the boards, I paid attention to both the

grain and color match across each panel and between the panels. You want the most consistent look possible in the completed top. Once the glueups are completed and the panels are cleaned up, be sure to mark where each one goes.

RULE JOINT. The next job is to form the rule joints and install the hinges (Rockler.com, #29256) between the top section and the leaves. This needs to be done before the shape of the table can be laid out and routed.

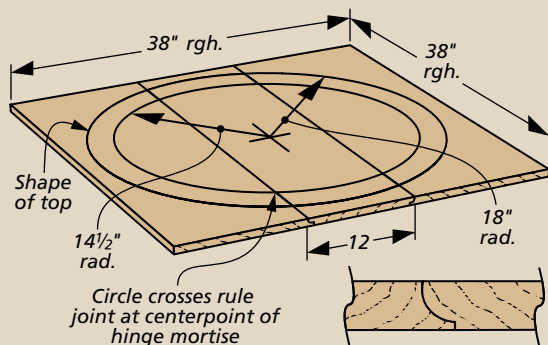
First, you'll need to rip and joint the top to final width (12"). The two edges should be perfectly straight and square. The mating edge on

each leaf should also have a clean and straight edge.

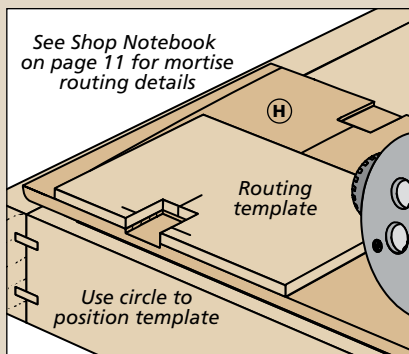
ROUTER TABLE. Your next step is the router table. Forming a smoothly functioning rule joint is definitely a satisfying piece of woodworking. Instead of getting into the details here, I've included a separate article all about routing a perfect rule joint.

THE HINGES. With the work at the router table completed, installing the table-leaf hinges is next. The goal is simple in theory. You want to position the hinges so that the cove on the leaf rotates smoothly around the roundover on the top with minimal clearance.

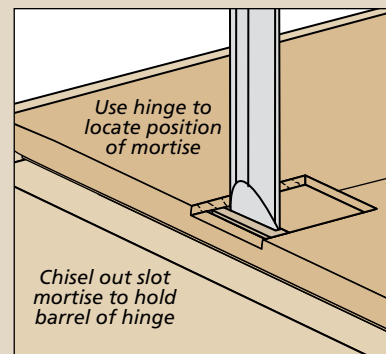
HOW-TO: INSTALL THE TABLE LEAF HINGES



Draw Two Circles. Draw one circle to define the shape of the top and another circle to mark the centerpoint of the hinge mortises.



Rout Mortises. I used a template and short pattern bit to rout the primary mortises for the table-leaf hinges.



Barrel Mortise. To complete the hinge mortises, chisel out a narrow slot for the barrel of the hinge.

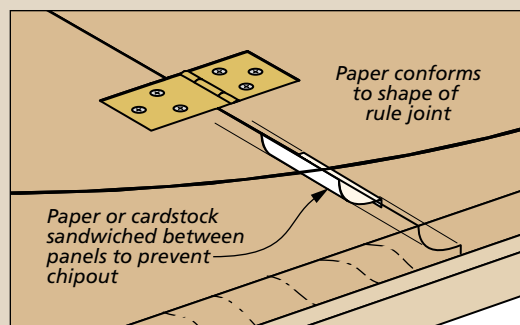
To accomplish this, the hinge pin is located near the centerpoint of the roundover. A slight offset ($\frac{1}{16}$ ") toward the outside edge will actually give you the best result (detail 'a,' page 7). This causes the leaf to move away from the roundover a bit as it's lowered and ensures the joint won't bind.

The box on the previous page shows how to locate and make the mortises for the hinges. A router and a simple template will help you do the job quickly. You'll find additional information on routing the hinge mortises in Shop Notebook on page 11. I should warn you that installing the hinges on a rule joint can be a little touchy and may require a bit of

post-installation tweaking. But when the rule joint works as smoothly as designed, you won't mind the effort.

CUT TO SHAPE. Once the hinges are installed and the swing of the rule joint checks out, the next step is to shape the top and leaves into a 36"-dia. circle. Cutting the circle to rough shape and then smoothing it by hand would be a tedious and time-consuming chore. And the results might not be up to snuff. So I chose a much easier method. Using a router, a trammel, and a straight bit to shape the top eliminated the hard work and gave me a perfectly round top. All the edge required was a little sanding. A look at the box below will fill you in on all the details.

SHOP TIP: PAPER SHIM



No Chipout. Avoid chipout when routing across the rule joints by shimming them with light cardstock. The flexible shim will back up the wood.

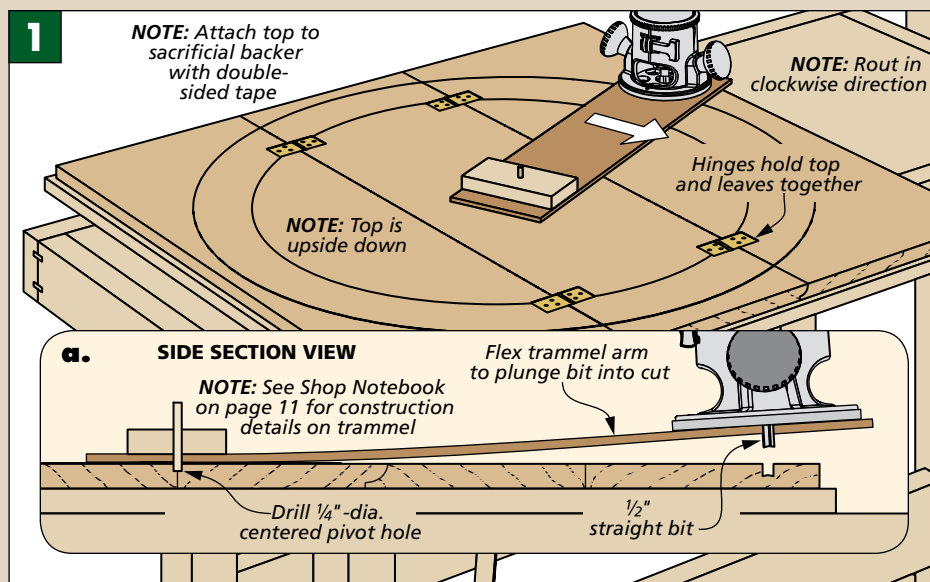
HOW-TO: SHAPE THE ROUND TOP

There are a couple of minor challenges to routing the circular drop-leaf top to shape. The first stems from the fact that the top is in three sections. You need a way to hold the sections firmly together that won't interfere with the trammel. The second problem is more common — avoiding chipout as you rout around the circle and as you cross the rule joints. Fortunately, I found an easy way to get around both of these problems.

HINGES INSTALLED. Figure 1 shows the setup I used to rout the top to its round shape. As you see, the clamping dilemma is solved by simply leaving the hinges in place. They'll keep the three sections snugly nested as well as perfectly aligned. And since they sit below the surface, they won't interfere with the trammel.

ROUT BACKWARDS. Obtaining a smooth, chip-free edge is the primary goal. But there's a catch. When routing a circle, the bit has to climb against the grain at a couple of spots. At best, you'll get a rough cut, but serious chipout is just as likely. There is a way to avoid this — rout in a different direction.

This trick starts by skipping the rough-cutting step. You'll simply



route the waste free with multiple cuts (Figure 1). Since you're routing a channel, you'll be cutting on both sides of the bit. This means you can safely backrout (rout clockwise) the circle and get a smoother edge.

THE TECHNIQUE. To get set up, I used double-sided tape to attach the top upside down to a sacrificial backer panel. Make sure that both the top and all the waste is tightly fastened. I controlled chipout at the rule joints by shimming them with cardstock at the appropriate spots (Shop Tip).

The trammel I used is very basic. The construction details can be found in Shop Notebook on page 11. It pivots around a dowel pin inserted into a shallow, centered hole you'll drill in the top.

The trammel technique is shown in Figure 1a. The flexible hardboard arm allows you to have the pivot pin engaged while keeping the bit above the surface. Then you just turn on the router, plunge the bit, and go. I cut through the top in a half dozen shallow passes.

Final Details

The top is just about ready to install on the frame. The final step is to add a profile to the edge. And what could be more appropriate than the same 1/2" roundover used on the rule joint? This gives the edge the same look whether the leaves are up or down.

EDGE PROFILE. You'll have to rout this profile free-hand, moving the router in the normal, counterclockwise direction. To do this, I first used double-sided tape to attach the top to a pair of spacer blocks.

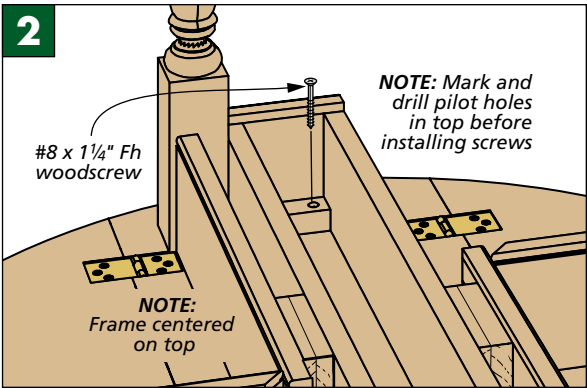
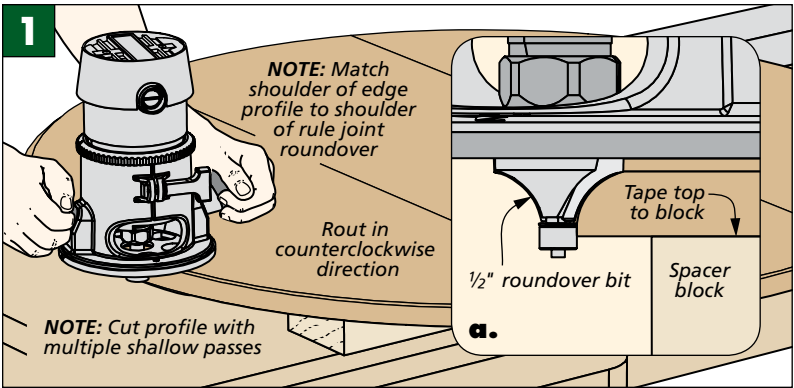
This provides clearance for the bearing that guides the cut.

The secret to a smooth profile is to make multiple, shallow passes, gradually lowering the roundover bit. The final cuts should be especially light. The goal is to match the shoulder on the edge profile with the shoulder on the rule joint.

INSTALLATION. After sanding the profile, the top (with the leaves attached) is ready to install. I laid it upside down on the bench and then

carefully centered the frame on it, as in Figure 2. Then I marked and drilled pilot holes in the top and finally installed the screws.

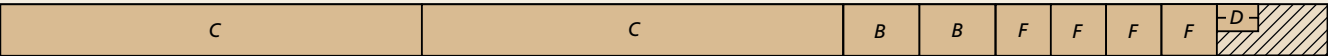
Following a trip to the finishing room (I applied *Woodkote's Jel'd Stain*), your swing-leg table can find a new home. But I'm guessing it won't stay put for long. A table this handy will likely be called to duty often.



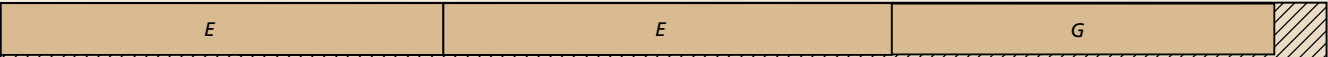
MATERIALS, SUPPLIES & CUTTING DIAGRAM

A	Legs (4)	2 1/8 x 2 1/8 - 29	G	Bead Molding (1)	5/16 x 3/4 - 72 rgh.
B	End Rails (2)	3/4 x 3 3/4 - 5 1/2	H	Top Blank (1)	3/4 x 13 - 38
C	Inner Side Rails (2)	3/4 x 3 3/4 - 30 1/2	I	Leaf Blanks (2)	3/4 x 13 1/2 - 38
D	Top Cleats (2)	3/4 x 1 - 3		(2 pr.) 1 1/2"-wide Table-Leaf Hinges w/Screws	
E	Outer Side Rails (2)	3/4 x 3 3/4 - 32 rgh.		(4) #8 x 1 1/4" Fh Woodscrews	
F	Support Blocks (2)	1 1/8 x 3 3/4 - 4		(1) 1/4"-dia. Brass Rod (12" long)	

3/4" x 4" - 96" Cherry (2.7 Bd. Ft.)



3/4" x 4" - 96" Cherry (2.7 Bd. Ft.)



3/4" x 7" - 96" Cherry (4.7 Bd. Ft.)



3/4" x 5" - 96" Cherry (Three boards @ 3.3 Bd. Ft. each)



ALSO NEEDED: Four pre-turned, Sheraton-style legs

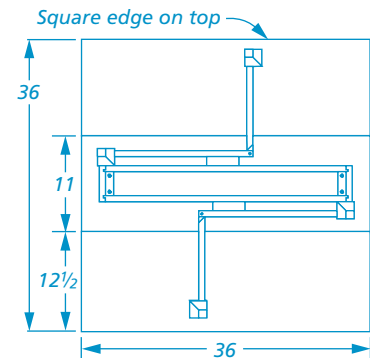
DESIGNER'S NOTEBOOK



TOP VIEW

NOTE: Frame built with tapered legs (see page 4)

NOTE: No bead molding added to frame



Country Style

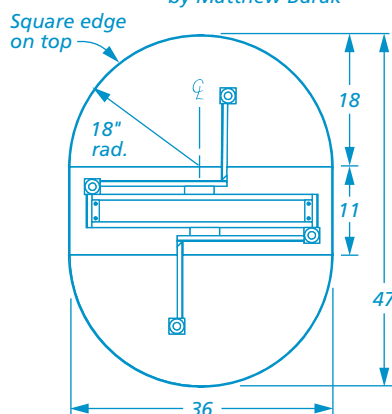
Swing-leg tables were meant to be utilitarian. And the simplified, country look of the table shown at left exemplifies this idea. It starts by substituting a basic tapered leg for the turned legs. The rest of the frame is identical except for the absence of the bead molding. A squared-off top with no edge profile completes the effect.

Shaker Influence

If you think that a larger table would better suit your needs, the design below might be the ticket. Here, I used the subtle details of Shaker design as my guide. The frame is built around a set of purchased, Shaker-style legs (TableLegs.com, #202-L.CH). The bead detail is included on the apron. To stretch the top, I made two semi-circular leaves that sandwich a rectangular center section. And again, I left off the edge profile.

TOP VIEW

NOTE: Shaker-style legs used to build frame are purchased from Classic Designs by Matthew Burak

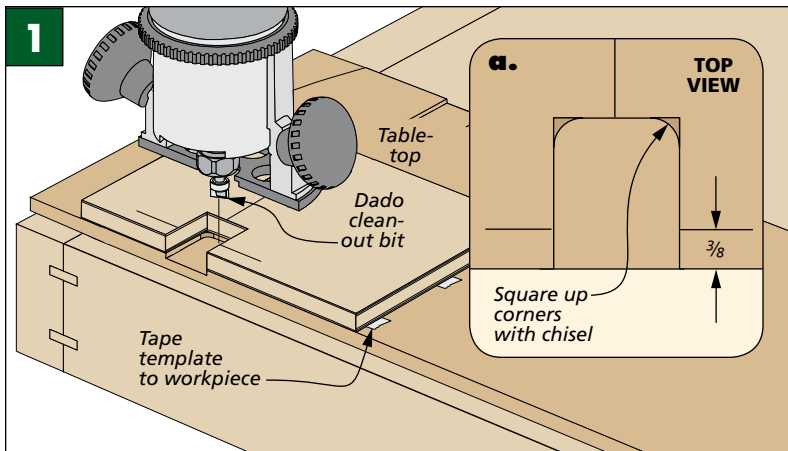
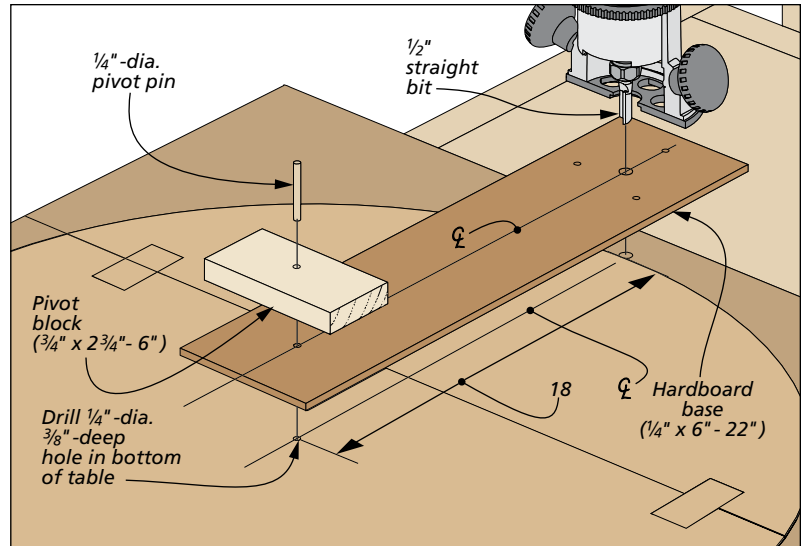


SHOP NOTEBOOK

Routing a Circle

To cut out the round top for the traditional swing-leg table, I decided to use a router and a trammel. I made the straightforward trammel out of a piece of $\frac{1}{4}$ " hardboard and a block of wood, as you can see in the drawing at right.

A pivot pin fits through the block of wood and into a hole drilled in the underside of the top. The router should be mounted to the trammel arm so the distance from the centerpoint of the pivot pin to the inside edge of the router bit is 18", giving you a 36"-dia. top.

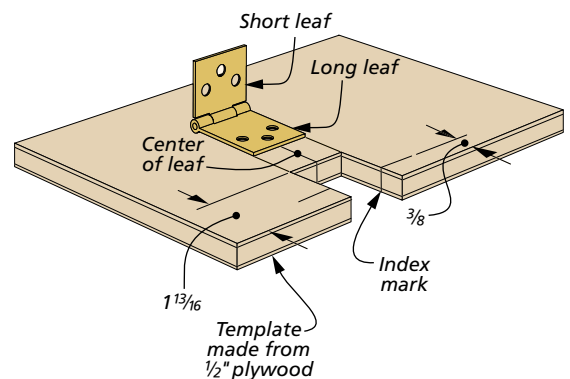
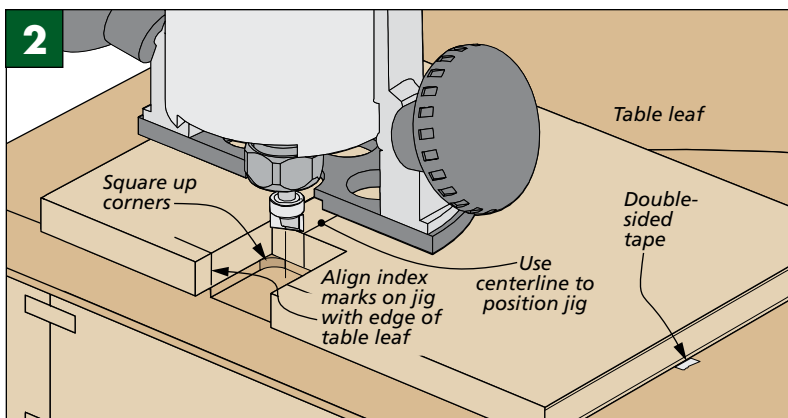


Mortise Template

Installing the drop-leaf hinges in the top and leaves of the swing leg table calls for some careful mortising. As with most hinge mortises, I decided to cut these with my router and a dado cleanout bit.

The key to routing a hinge mortise is to have a good template. In this case, however, a single template wouldn't do because the mortises in the tabletop are longer than those in the leaves.

So what I did was make a template with an opening sized for the mortise in the tabletop. Then I made index marks on the template so I could line it up with the edge of the table leaf to rout the other half of the mortise.





▲ A knuckle joint allows the table leg to pivot.

Knuckle Joint Jig

In order to allow the legs on the swing-leg table to pivot, the rails are hinged with a traditional knuckle joint. If you look at the photo at left, you'll see that this knuckle joint looks remarkably similar to a box joint. And it is. In fact, to cut the knuckle joint, I used an oversized box joint jig on my table saw, as shown in the drawing at right.

The jig is just a plywood fence with a $\frac{3}{4}$ "-wide notch cut in the bottom edge for an index pin. After attaching a hardboard bottom to the fence and gluing the index pin in place, you can clamp the jig to your miter gauge and cut a second notch that's $\frac{3}{4}$ " away from the index pin.

The slots and pins are cut just like box joints. Place the fixed rail section against the index pin and cut a slot, as shown in detail 'a.' Then place this slot over the pin and cut the next slot (detail 'b').

To cut the first slot in the swinging rail, leave the fixed rail in position on the jig and butt the swinging rail up against it (detail 'c'). Then you can cut the remaining two slots using the index pin as a reference.

